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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,511	07/11/2000	Wanda Andreoni	CH-1999-0004US1	2057

7590 08/26/2003  
Ference & Associates  
129 Oakhurst Road  
Pittsburgh, PA 15215

EXAMINER

XU, LING X

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 08/26/2003

21

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-21

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/614,511	ANDREONI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ling X. Xu	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
     If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
     a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/14/2003 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant has amended claim 8 to include the negative limitation of "Alq3 is substituted solely in the 3-, 4- and 5-positions" and claim 15 to include the negative limitation of "Alq3 is substituted solely in the 3 or 4-position and the 5-position". The

newly added negative limitations are not supported by the specification. The specification does not disclose that the Alq3 is substituted solely in the 3-, 4- and 5-positions in claim 8 or 3- or 4- and 5- positions to the exception of all other possible combinations.

Any negative limitation must have basis in the original disclosure. See *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 USC 112, first paragraph as failing to comply with the written description requirement. See *MPEP 2173.05(i)*.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 8, line 2, it recites that the Alq3 is substituted solely in the 3, 4 and 5-positions which implied that the substations are in all three positions. This is inconsistent with the recitation that Alq3 is substituted in 3 and 5-positions or 4 and 5-positions in lines 4-7.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al. (US 4,885,211) in view of Moore et al. (US 5,484,922).

Tang discloses that an EL device comprises an anode, an organic luminescent medium with at least two separate organic layers, and a cathode (Col. 4, lines 44-50). The organic luminescent medium contains at least two separate organic layers, such as hole transporting zone and electron transporting zone (Col. 10, lines 48-67). Tang also discloses that the organic electron transporting zone contains tris(8-quinolinol)aluminum  $\text{Alq}_3$  (Col. 16, lines 1-45) as luminescent materials. The electron transporting zone also functions as luminescent layer.

Tang does not disclose that  $\text{Alq}_3$  is substituted in 3- or 4- position with electron-donor group and in 5-positions simultaneously with an electron-acceptor or p-delocalizing group.

Moore teaches the use of substituted aluminum chelate compound in an EL device (Col.5, lines 45-67). The substitutes may be made in any or all six positions including 3-, or 4- and 5-positions of the quinoline ring [Col. 5, formula (III)].

Moore also teaches that substituents on the 8-quinolinolato rings can also perform useful hue shifting functions. The quinoline ring consists of fused benzo and pyridino rings. When the pyridino ring component of the quinoline ring (2, 3, and 4 positions of the quinoline ring) is substituted with one or more electron donating

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substituents the effect is to shift the hue of emission to lower wavelength (Col. 6, lines 59-67). When any or all the benzo ring components of the quinoline ring (5,6, and 7 positions of quinoline ring) is substituted with electron accepting substituents the effect is to shift the hue of emission to shorter wavelengths (Col. 7, lines 10-20). Moore lists the possible substituents as electron donating and accepting substituents, such as –  $\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}$ ,  $-\text{OCH}_3$ ,  $-\text{OC}_2\text{H}_5$  (Col. 7-10).

Therefore, absence of showing unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the claimed substituted  $\text{Alq}_3$  compound for Tang's EL device, because Moore disclose the use of same or similar substituents on the 8-quinolinolato rings can perform useful hue shifting functions.

Moore does not specify every claimed substitute, such as  $\text{CF}=\text{CF}_2$ , however, Moore lists substitutes that have same or similar structure as the claimed substitutes, such as hydrogen, hydrocarbon groups contain 1-10 carbon atoms, amino, cyano, halogen, and  $\alpha$ -haloalkyl substituents, etc. (Col. 5, lines 60-67). Moore also specifies the possible substituents as electron donating and accepting substituents, such as –  $\text{CH}_3$ ,  $-\text{CF}_3$ ,  $-\text{CH}$ ,  $-\text{OCH}_3$ ,  $-\text{OC}_2\text{H}_5$ ,  $\text{CH}=\text{CCl}_2$  (Cols. 7-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the claimed  $\text{Alq}_3$  compound with substitutes, such as  $\text{CF}=\text{CF}_2$ , in Tang's EL device because Moore discloses the use of same or similar substituents on the 8-quinolinolato rings. One skilled in the art would have been

motivated to use the compound with expectation that similar compound in structure will have similar properties and same utilities.

5. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al and Moore et al. as applied to claims 8-14 above, and further in view of applicants admission.

As stated above, Tang and Moore disclose the use of substituted Alq<sub>3</sub> in an EL device.

Tang and Moore disclose a two-layer structure wherein an electron transporting layer having both light emitting properties and electron transporting properties. Tang and Moore do not disclose that the EL device has a luminescent layer in addition to the hole injecting/transporting zone and an electron injecting/transporting zone. However, it is well known in the art that an EL device having a three-layer DH structure and two-layer SH-A and SH-B structures, depends on where the emissive layer is positioned. It is also supported by Applicants' statement in the Specification (Page 8, lines 4-10) that the organic EL device could have two (also page 1, lines 17-20) or three layers structure in addition to the electrodes. Both three-layer and two-layer EL device have the same functions including hole injecting/transporting, light emitting, and electron injecting/transporting. In the two-layer structure, one layer may function more than one function, such as hole injecting/ transporting and light emitting functions (the SH-A type) or light emitting and electron injecting/ transporting functions (the SH-B type) to obtain the same electroluminescent effects as the three-layer (the DH type).

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Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to add a separate light emitting layer or to make a three-layer structure to Tang's and Moore's EL device since it is well known in the art, and also supported by applicants' admission, that an EL device can have either two- or three-layer structure depends on where the light emitting layer or zone is positioned, both two- or three-layer structure have the same electroluminescent effects.

### ***Response to Arguments***

6. Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues that Moore does not provide a teaching of the instantly claimed composition because the instantly claimed invention requires specific substitutions of a very specific nature and these specific restrictions are not provided by Moore. The Examiner disagrees.

Moore teaches substitution can be made at any or all six positions of the aluminum chelates. Specifically, Moore teaches any substituents in the 2, 3 or 4 positions are preferably electron donating (Col. 7, lines 1-14) and any of substituents at the 5, 6 and 7 quinoline ring positions are preferably electron accepting (Col. 7, lines 15-20). The teaching clearly includes the specific substitutions of 3 or 4 and 5-positions as claimed.

Applicant also cited Moore at column 3, lines 56-60, and argue that Moore disclosed a mixture of substituted ligands and unsubstituted ligands is not the same as



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the instantly claimed compounds and could not be expected to provide the same material properties of the claimed invention.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As stated above, the combination of Tang and Moore teach the claimed invention.

Tang discloses that EL device comprises tris (8-quinolinol) aluminum as luminescent materials. Tang does not disclose that Alq<sub>3</sub> is substituted in 3- or 4-position with electron-donor group and in 5-positions simultaneously with an electron-acceptor or p-delocalizing group.

Moore teaches the use of substituted aluminum chelate compound in an EL device. The substitutes can be made in any or all six positions including 3-, or 4- and 5-positions of the quinoline ring.

The teaching of the Moore would have been obvious to one skilled in the art to make Alq<sub>3</sub> with substitutions in any or all the positions including 3- or 4- and 5-positions, absent of showing unexpected results, as stated above.

Applicant also argue that the product produced by the Moore's reference would not result in the instantly claimed invention because the instantly claimed invention does

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not allow for substituents at all positions and only allows for requires specific substituents at specific positions.

Moore teaches that any or all six positions of the aluminum chelates can be substituted. Specifically, Moore teaches any substituents in the 2, 3 or 4 positions are preferably electron donating (Col. 7, lines 1-14) and any of substituents at the 5, 6 and 7 quinoline ring positions are preferably electron accepting (Col. 7, lines 15-20). The teaching clearly includes the specific substitutions at 3 or 4 and 5-positions as claimed.

It is suggested that applicant to submit an affidavit or declaration to show the substituted Alq3 at the specific 3- or 4- and 5-positions as recited in the instant claims has better than expected result compared to other substituted Alq3 disclosed by Moore in order to overcome the obviousness rejections set forth above.

Applicant also argues that Moore does not specifically suggest the specific combination recited in the instant claims and certainly does not suggest the combination to the exception of all other possible combinations.

As stated above, the negative limitation of the specific combination to the exception of all other possible combinations recited in the amended claims is a new matter and is not supported by the specification of the present application.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling X. Xu whose telephone number is 703-305-0395. The examiner can normally be reached on 8:00 - 4:30 Monday - Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah D. Jones can be reached on 703-308-3822. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Ling X. Xu  
Examiner  
Art Unit 1775

lx

LX

*Deborah Jones*  
DEBORAH JONES  
SUPERVISOR EXAMINER